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ABSTRACT

Data reported in this paper were collected as part of a larger longitudinal study of the development of young Chicano or Mexican American children and their families. The measures completed by the children included the McCarthy Scales of Children's Abilities, a standardized instrument that measures general intellectual level. The first three scales are combined to make up the General Cognitive Index (GCI). This paper focuses on the psychometric properties of the GCI when administered to normal Chicano children. Analyses are based on a random sample of 75 subjects from the Early Environmental Experience Project database. Each child was initially tested in the child's own language at about 2.5 years of age and every 6 months thereafter for 4 longitudinal points. Results provided impressive evidence of the psychometric strengths of the GCI, indicating that the properties of GCI scores were as sound for Chicano children as they are for White English-speaking children. (Contains three tables and eight references.) (SLD)

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ASSESSMENT OF CHICANO CHILDREN'S PERFORMANCE ON THE COGNITIVE INDEX SCALE

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Princeton, New Jersey
March 1988

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* Invited paper presented in a symposium, "Psychological Testing with Hispanics: New Research Findings" (L. Comas-Díaz, chair), 95th Annual Convention of the American Psychological Association, New York City, August 29, 1987.

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Assessment of Chicano Children's Performance on the Cognitive Index Scale *

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The data reported in this paper were collected as part of a larger longitudinal study of the development of young Chicano, or Mexican-American, normal children and their families. The measures obtained on the children included the McCarthy Scales of Children's Abilities (MSCA; McCarthy, 1972). This standardized instrument is designed to measure the general intellectual level, and also the strengths and weaknesses in specific ability areas, of children between the ages of 2 1/2 and 8 1/2 years. It consists of 18 separate tests that compose six scales: the Verbal, Perceptual-Performance, Quantitative, Memory, Motor, and General Cognitive Index scales. The first three scales contain 15 of the 18 tests and are combined to make up the General Cognitive Index (GCI).

The focus of this paper is on the GCI--specifically, its psychometric properties when the MSCA is administered to normal Chicano children. The McCarthy scales are increasingly being used as an alternative to traditional IQ tests. For this reason, it is important to determine their psychometric characteristics when used with diverse ethnolinguistic groups.

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Sample

The analyses reported here are based on a random subsample of 75 subjects from the EEEP database. The Early Environmental Experience Project (EEEP) database was designed and assembled as a source of extensive information, for purposes of scientific research, on a volunteer sample of 100 Chicano, or Mexican-American, families with a normal child born in Bexar County (San Antonio), Texas, between January 1975 and December 1976 inclusive. The sample selection process and criteria and its demographic characteristics have been described elsewhere (Laosa, 1982, Study 1) and are summarized only briefly here. To control for the possible confounding effects of variations in parental absence/presence, maternal employment/unemployment, and out-of-home care, only included were households in which, when the child was 2 1/2 years old, both parents lived with the child, the mother was not employed outside the home on a full-time basis, and the focal child did not attend a nursery school or daycare center. To minimize longitudinal attrition, preference was given to families with the longest history of residence in south-central Texas (families with plans to move from this area during the 3-year period of data collection were excluded) and those in which the father was employed. Otherwise the sample is generally representative of U.S. Chicano, or Mexican-American, families, particularly with regard to its socioeconomic status (SES) distribution; the sample is thus widely heterogeneous with regard to SES. No two focal children belonged to the same household. The sample has been followed longitudinally, and data have been collected when the focal child was 2 1/2, 3, 3 1/2, and 4 years old. Sample attrition over this period was 7%.

The use of language in the homes varied widely, as is typical of this ethnic group (Laosa, 1975), ranging from households in which English predominated, to families who used both languages with about equal frequency, to those who spoke a dialect that intermixes both languages, to those who used Spanish almost exclusively.

Procedures

Each child was initially tested at age 2 years 6 months (± 2 months), and every 6 months thereafter (± 2 weeks) for a total of 4 longitudinal points. Each child was tested individually in the home by a trained examiner, following the standard instructions specified in the published test manual (McCarthy, 1972). In addition to the English-language edition, the examiners were issued a careful translation of the test into local San Antonio Spanish, prepared for purposes of this research. The examiners were bilingual, college educated women of the same ethnolinguistic background and communities as the children. Testing was conducted in the child's language or dialect (English, Spanish, or a dialect that switches and/or mixes the two languages). Records of the language patterns used in the testing sessions revealed that 77.5% of the test administrations took place predominantly in English (by predominantly is meant at least three fourths of the examiner-child interaction).

Reliability

Reliability was assessed by means of Spearman-Brown split-half (odd-even) coefficients, calculated separately by age. The results showed reliability coefficients with magnitudes greater than .90 at every age (Table 1). Specifically, the Spearman-Brown coefficients were .94 at age 2 1/2

years, again .94 at age 3, .91 at age 3 1/2, and again .94 at age 4. These coefficients clearly indicate high reliability. These internal-consistency reliability coefficients for Chicano children's MSCA General Cognitive scores are in the same general range as those reported for other samples (Kaufman, 1982), including the instrument's standardization sample (McCarthy, 1972).

Test-Retest Correlations

Test-retest correlations (Pearson product-moment rs) were calculated in order to determine the stability of the GCI scores over time. The results were as follows:

The r between the scaled scores at age 2 1/2 and those obtained 6 months later, at age 3, was .70. The r between the scores at age 2 1/2 and those obtained a year later, at age 3 1/2, was .62. The r between the scores at age 2 1/2 and those obtained 18 months later, at age 4, was .61.

The r between the scores at ages 3 and 3 1/2 was .74. That between 3 and 4 years of age was .82. And finally, the test-retest r between ages 3 1/2 and 4 was .78.

All of the test-retest correlations were significant beyond the .001 level, as Table 2 indicates. The substantial magnitude of the test-retest correlations clearly show that Chicano children's GCI scores are generally stable at least during the preschool years.

Validity

Evidence of validity was obtained by correlating the GCI scores with scores on another test of intellectual development, the Caldwell Preschool

Inventory (PI; Cooperative Tests and Services, 1970, 1974). The PI was administered twice to each child, initially at age 3 1/2 years and again 6 months later, on each occasion within approximately a week's time of the MSCA administration.

The concurrent *r*s between the GCI scaled scores and the PI total correct scores were .74 at age 3 1/2 and .80 at age 4. The predictive *r* between PI scores at age 3 1/2 and GCI scores at age 4 was .75; obversely, the predictive *r* between GCI scores at age 3 1/2 and PI scores at age 4 was .70 (*N*s = 69-74; *p*s < .001, one-tailed tests).

To the extent that the Preschool Inventory scores are valid measures of the children's general intellectual development, the results provide confirmatory evidence of the validity of the MSCA General Cognitive Index scores as measures of general cognitive ability for 3 1/2- and 4-year-old Chicano children.

Means

How do the GCI scores obtained by the Chicano children compare with the published U.S. national norms for this assessment instrument? The GCI is scaled to have a mean of 100 and a standard deviation of 16 at every age (McCarthy, 1972). The mean GCI scores for the Chicano children in the present study were 93, 99, 98, and 95, respectively, at each age. The standard deviations ranged from 13 to 14. Clearly, then, these Chicano children's GCI scores were, on the average, well within the national norms for this test.

With regard to sex differences, girls performed slightly better than

boys, as Table 3 shows, although the difference was not significant at every age (respective ps = .10, .03, .34, and .07 at ages 2 1/2, 3, 3 1/2, and 4).

Conclusions

The results of the analyses reported here provide impressive evidence of the psychometric strengths of the MSCA General Cognitive Index. Specifically, the data clearly demonstrated that the examined psychometric properties of the GCI scores were as sound when the test was administered to a sample of Chicano children as they are sound when administered to non-Hispanic White English-speaking children.

In closing, it should be emphasized that for purposes of making evaluative decisions about a test, reliance upon psychometric properties is not enough. Tests should be evaluated not only in terms of their measurement properties, but testing applications should be evaluated also in terms of their potential social consequences (Laosa, 1982, 1984; Messick, 1980). The former issue is answerable on scientific and technical grounds by appraising psychometric evidence. The analyses reported here bear directly on this issue. To the second issue belong questions of the appropriateness of test use in proposed applications. These questions are answerable on ethical grounds by appraising potential consequences of the testing (Messick, 1980).

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Table 1

Reliability Coefficients for the General Cognitive Index, by Age

	Age (years)			
Statistic	2 1/2	3	3 1/2	4
r_{S-B}	.94	.94	.91	.94
Items[a]	80	100	100	114
N[b]	66	69	74	70

r_{S-B} = Split-half (odd-even) coefficient corrected by the Spearman-Brown formula.

[a]Number of items included in calculating the coefficient. (Items with zero variance were deleted prior to calculating a coefficient.)

[b]A coefficient was calculated for only those subjects with complete data on all the scale's items.

Table 2

Test-Retest Correlations for the General Cognitive Index

Ages correlated	*r*	*N*[a]
2 1/2 & 3	.70	63
2 1/2 & 3 1/2	.62	67
2 1/2 & 4	.61	63
3 & 3 1/2	.74	69
3 & 4	.82	67
3 1/2 & 4	.78	70

Note. Pearson product-moment correlations based on scaled scores. All coefficients are significant beyond the .001 level, one-tailed tests.

[a]Missing data represent subjects with incomplete protocols for some MSCA subtests and for whom no GCI was therefore calculated.

Table 3

Means and Standard Deviations for the General Cognitive Index, by Sex and Longitudinal Point

	Age (years)			
Sex sample	2 1/2	3	3 1/2	4
Boys				
M	90.70	95.45	97.21	92.31
SD	16.01	12.89	12.82	13.87
Girls				
M	95.27	101.24	98.48	97.16
SD	12.54	12.02	12.57	13.74
All				
M	93.22	98.64	97.89	94.94
SD	14.27	12.66	12.62	13.91

Note. Scaled scores. *N*s = 67-74 for the combined sex sample (all); *n*s = 30-34 for boys and 37-40 for girls.